MINE VALUATIONS
MINE AND LAND SURVEYS
DRAFTING

REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO. E-691 OKLAHOMA NO. 448
MEMBER A. I. M. & M. E.

WILLIAM M. STEWART ENGINEERING CO.
MINING AND CIVIL ENGINEERS
40 YEARS EXPERIENCE IN TRI STATE DISTRICT
218 WEST THIRD STREET
PHONE 11
JOPLIN, MISSOURI

February 1954

[redacted]
Joplin, Missouri

Gentlemen:

I have made an extensive study of the water supply situation in relation to the present and future requirements of your plant at Atlas, Missouri. While the situation is not critical at the present time it will become so when the known zinc and lead ore reserves in this area are mined.

From an economic standpoint you are dependent on the water reservoirs and the inflow into the old mined out areas of Duenweg Zinc and Lead district, and mainly on the Federal-St. Regis and Athletic reservoirs; these last two, with the Federal pumping the west portion of their property with a natural drainage to the West, have a dead water reserve of 286,000,000 gallons.

The inflow before the extreme dry weather of the past several years was 1400 GPM at the Knickerbocker, and reported as 3000 GPM at the St. Regis but from data based on late measurements and your pumping at the North St. Regis shaft this inflow is evidently down to some 1300 GPM. On Jan. 23rd, 1954 the water stood in the Athletic 154. feet from the top of the shaft (941. Sea-Level), in the St. Regis 169.5 feet from top of shaft (910. S. L.), 31.0' below the water in the Athletic.

The Athletic or Old Lincoln mine is the deepest in the area with an overall mined out area of 31.0 acres, a reservoir of 26.0 acres with an average depth of 13.0 feet after deducting the pillars and ribs and has a mine face approximately a mile in length which, considering its depth, should have an inflow of better than 2000 GPM even in extended dry periods. There is a large fracture running to the north that is open over 30.0 feet below the floor of the Athletic. Figuring the 26.0 acres at a height of 12.0 feet there is a dead water reservoir of 102,000,000 gallons. Before this dry period the head or water level in the Athletic was around 100.0 feet from the surface. The saving in power cost of a 100' difference in head with a 10" pumping 24 hours a day a month is $185.00.

NOTE: PUMPING AT SCOTT MINE 1800 GPM LOWERED ATH WATER TO TOP MINE WORKINGS REPORTED BY FEDERAL

In my opinion since you must have a dependable water supply from here on and at the lowest pumping cost possible you should purchase not less than the North 50 acres of the West Half of the Northwest Quarter of Section 3, which covers the present cut out area.

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MISSOURI NO. E-831 OKLAHOMA NO. 448
MEMBER A. I. M. & M. E.

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Due to the fact that there is a 251.0 foot shaft on this fifty acres which was cleaned out and recribbed several years ago by the present owner at considerable expense you may have to purchase more than the fifty acres to compensate him for the value of the shaft, but having in mind the future mineral value of this acreage it would be to your interest to purchase additional acreage rather than pay for the shaft.

I submit, under separate cover, with this report six maps covering the immediate area of your present pumping plant and also the area where any pumping in the future would affect your present and suggested pumping station.

Based on information from the Federal or American Smelting and Refining Company's Engineers the only pumping that would to any extent affect the Athletic shaft would be on the Scott Mine to the west and then only to the roof of the Athletic mine workings.

I submit also with this report a water data sheet as of pertinent dates, compiled by water measurements by the Federal Mining and Smelting Co., from Jan. 4th, 1934 to March 18th, 1936; by the Stewart Engineering Co., weekly measurements for the Eagle Picher Mining Co., from January 1935 to June 1940; Brown & Root from August 1943 to October 1951, and for Thurston Chemical Co. from August 3rd, 1953 to January 23rd, 1954.

Following is a general resume and data based on the earlier dewatering of the Oronogo to Duenweg mining district.

Respectfully submitted,

William M. Stewart

WMS/vks

William M. Stewart, P.E. No.-831

MINE VALUATIONS
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REGISTERED PROFESSIONAL ENGINEER
MISSOURI NO. E-681 OKLAHOMA NO. 446
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The pumping in the Oronogo bottoms just South of Oronogo, Mo., started January 18th, 1935. By December 4th, 1935 before a 14" and an 8" Pump was installed in the old Good Shaft in the North Webb City area the water in the Ice Plant Mine on the South end of Drainage area No. 1 had been lowered only 36. feet. The Mont B area and on South was unaffected.

On January 11th, 1936, with above pumping the Mont B water in North end of Drainage area No. 2 had gone down 11.0 feet, and the water in the Cornfield shaft (North end of Drainage area No. 5) down 2.0 feet.

With no pumping in the area from the Mont B on the North to Duenweg on the South, the 16" pump at the Star shaft (Station No. 7) and two 14" pumps at the East Star shaft (Station No. 6) had lowered the water 53.0 feet in the Mont B and 16.0 feet in the Federal Pump shaft at Duenweg.

On April 24th, 1937, a 14" Pump (2700 GPM) was started in the Hyde Park shaft just North of your 20 acre fee, known as the Knickerbocker (Drainage Area No. 6). There were no pumps in Drainage Areas 2, 3, 4, and 5. The water in Area No. 1 was held at 744. Sea Level.

The Hyde Park pumping affected the water only from the Florine Mine (Drainage Area No. 5) South. In four months the water was lowered 159.0 feet in the Hyde Park, 33.0 feet in the King William; 22.0 feet in the Coahuila, and 5.0 feet in the Florine. The water during this period raised 9.0 feet in the Mont B and 3.0 feet in the Kirkwood; however, there was a total of 15 inches of rainfall during May, June and July. The records do not show any raise in the water in the Star Ice Plant pool.

With the Hyde Park 14", the Florine 10" and the National 10" pumping the water was lowered from Aug. 8th, 1937 to Nov. 14th, 1937, some 30.0 feet in the Mont B-Kirkwood area, some 52.0 feet in the Florine Ten O'Clock area, 38.0 feet in the Nowata, 30.0 feet in the Vogey and 20.0 feet in the Federal Pump shaft at Duenweg. On this date there was only 2.0 feet of water in the Hyde Park shaft.

On November 17th, 1937 the 14" pump from the Hyde Park shaft was started at the Melrose shaft and a 10" pump at the Knickerbocker shaft on your 20 acre fee just South of the Hyde Park. With these pumps and the National and Florine pumping the water was lowered by March 5, 1938 (one week before the Knickerbocker was shut down and the 8 inch pump started on the Mont B) an additional 10 to 18 feet in the Mont B-Kirkwood area; 39.0 feet at the Florine; the Ten O'Clock and the Nowata were dry; the Watcheer Coahuila and Vogey were lowered some 30.0 feet; the King William 9.0 feet and Federal Pump Shaft, 6.0 feet.

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On March 11th, 1938, the Knickerbocker 10" was shut down and an 8 inch started in the Mont B. By May 16th, 1938 (nine weeks later) with the National 10 inch, the Florine 10 inch, the Mont B 8 inch and the Melrose 10 inch pumping steady (the Melrose 14" not pumping) the Ten O'Clock and Nowata mines were dry, the water had raised 5.0 feet in the Coahuila and Vogey, 17.0 to 23.0 feet in the King William and Federal shafts and 106.0 feet in the Hyde Park and Knickerbocker, the water was lowered 6.0 feet in the Mont B, 3.0 feet in the National, Good Shephered and Brick Mill, 2.0 feet in the Cornfield and Kirkwood and 7.0 feet in the Florine Lucky Budge. The Hyde Park water raised 85.0 feet the first week after the pump was pulled and then 21.0 feet in the next 7 weeks.

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DATA SHEET

Drainage Area	Date	Description	At Sea Level	
No. 1	July 18, 1936	Sheet ground drained	749.	
No. 2	" " "	Mont "B" water	869.	120' above
No. 3	" " "	Brick Mill	909.	49' above
No. 5	" " "	North end Concord	916.	
No. 5	" " "	Middle-Kirkwood	920.	
No. 5	" " "	Lucky Budge-Florine	967.	
No. 5	" " "	Melrose	975.	
No. 5	" " "	South end Coahuila	991.	146' above floor
No. 6	" " "	North end Vogey-Whitsett	994.	127' " "
No. 6	" " "	Hyde Park	1005.	55' below top 160' above floor
No. 7	" " "	Federal Pump Shaft	1021.	60.5' below T.C. 144' above floor

14" Pump - Hyde Park Shaft 2700 GPM. Beat the water
10" Pump - Knickerbocker Sh. 1400 GPH. Inflow

THURSTON CHEMICAL

Date	Hyde Park	St. Regis	Vogey	Feet above Hyde Park
April 24, 1937 (Before Hyde Park)	1016.7	1030.0	1005.5	
15 weeks	- 163.6	- 23.6	- 28.8	
August 7, 1937	853.1 + 153.3	1006.4	976.7	123.6
8 weeks	- 7.1	- 12.0	- 20.8	
October 2, 1937	Dry 846.0 + 148.4	994.4	955.9	110.
23 weeks	+ 86.0	- 13.0	- 39.0	
March 12, 1938	932.0 + 49.	981.0 - 64.	917.0	

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HYDE PARK DRAINAGE AREA

Hyde Park - 14" - at 2700 GPM
Florine - 10" - at 1400 GPM
National - 10" - at 1400 GPM
3 Pumps..... 5500 GPM

5500 GPM x (60' x 24), 1440' = 7,920,000 GP Day
8 wks x 7 days = 56 days x 7,920,000 GPD = 443,500,000 Gallons
1250 GPM x 60' - 75,000 GPH x 24 hours = 1,800,000 GP Day

	Depth to water	
April 24, 1937	43.5	14" - 2700 GPM
Lowered	163.5 (15 weeks)	
August 7, 1937	207.0	

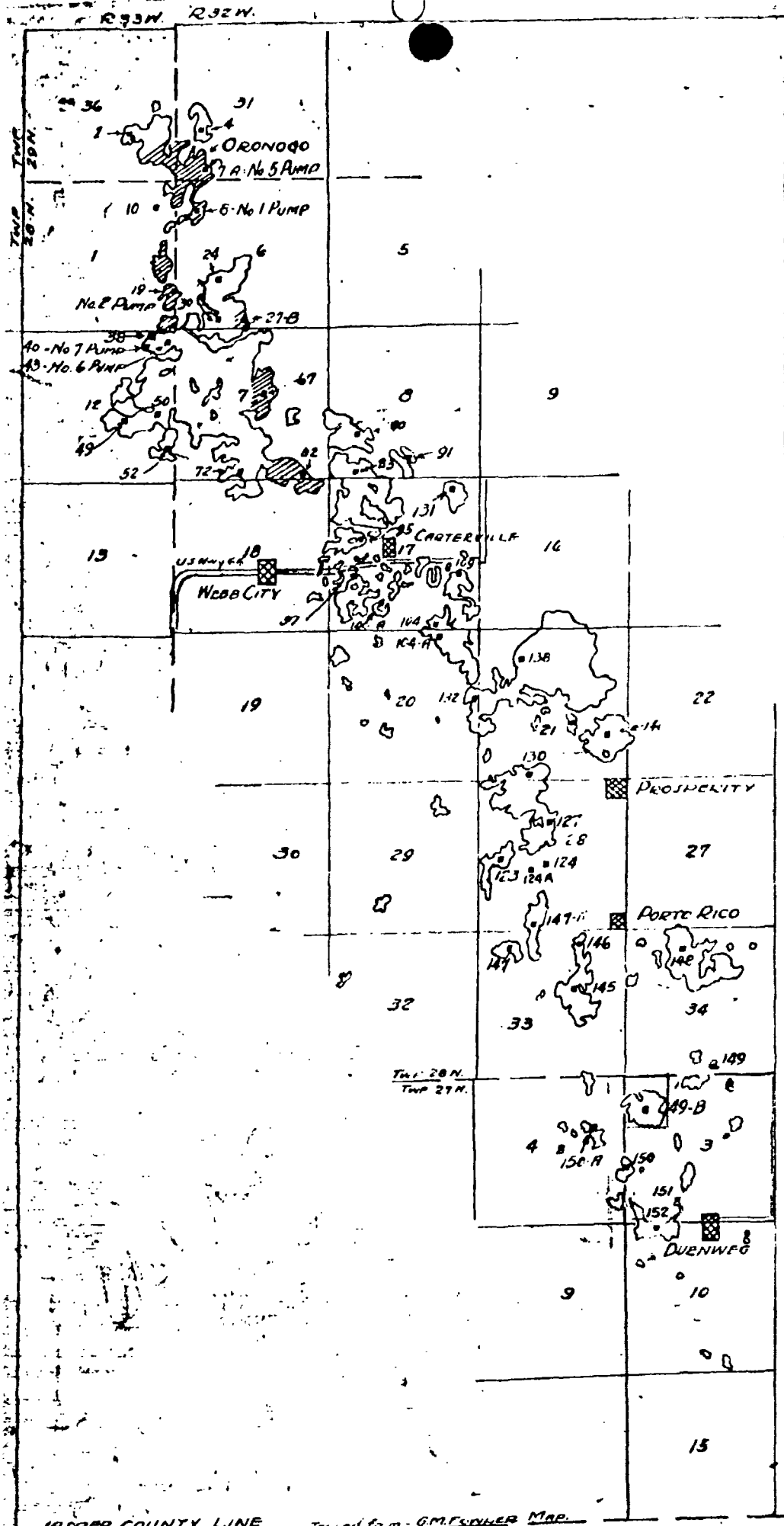
2700 GPM x 60' = 162,000 GP Hour
x 24 hours = 3,888,000 GP Day
x 7 days = 27,216,000 GP Week
x 15 weeks = 408,240,000 gallons
15 wks - 408,240,000 ÷ 163.5 ft. = 2,500,000 gal. per ft. of depth
8 wks - 217,728,000 ÷ 7.0 ft. = 31,104,000 " " " " "
23 wks - 625,968,000 ÷ 170.5 ft. = 3,700,000 " " " " "

August 7, 1937 207' 23 weeks
- 7' in 8 weeks
Oct. 2, 1937 - 214' + 443,500,000 gallons pumped per ft. of depth

14" + 2-10" - 8 wks at 5500 GPM = 443,500,000 gallons ÷ 214' = 2,072,000 gal. per ft. of depth

8 wks at 2700 GPM = 217,728,000 gallons

217,728,000 - 7 ft. = 31,104,000 gallons per ft. of depth

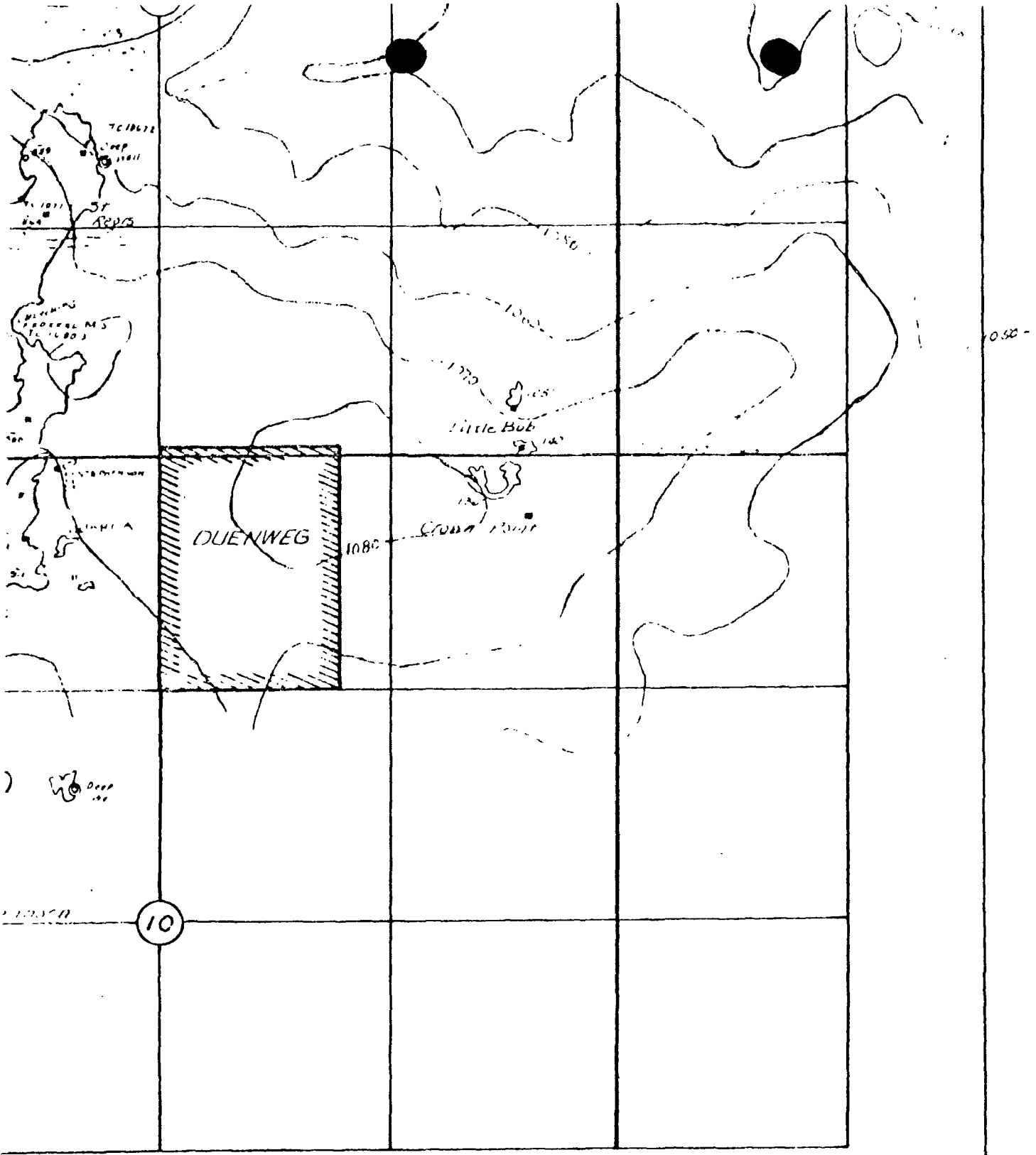


STR. NO.	LEASE NAME	CASING EL.	WATER DEPTH	BOTTOM EL.	FLOOD EL.
4	LA TOSCA	914.0		782.0	
1	PINNACLE				
7-A	No. 5 PUMP	902.0		728.1	
10	ROSE BUD	892.3		758.8	
8	No. 1 PUMP	898.0		728.0	
24	MINOR HEIR	892.7		754.8	
19	No. 2 PUMP	893.8			
30-A	S. RED DOG	960.4		748.5	
27-B	YELLOW DOG	921.8		757.9	
38	STAR	899.6		745.4	
40	No. 7 PUMP	910.2		732.9	
43	No. 6 PUMP	906.5		737.0	
	NEW No. 10 PUMP KNICKERBOCKER	1056.6			
50	BERTHA 'A'	973.0		749.9	
49	ATHLETIC	965.9		761.3	
77	RHEA. N	983.4			
52	HANSEL	971.6		757.8	
91	CHAPMAN	925.4			
72	MERCANTILE	951.3			
	MELROSE S.E. 1/4	1077.3			
83	MONT-'B'	988.9		806.7	
131	SCHOOL HOUSE	973.4			
95	GOOD SHEPARD	953.8			
109	CONCORD	992.6		821.6	
	MELROSE M.S.	1085.8			
100-A	BRICK MILL	963.0		771.1	
104	HOMESTEAD	995.5		807.7	
104-A	CORNFIELD	992.2		806.4	
138	CONTINENTAL	1054.9		805.3	
132	KIRKWOOD	1004.0		805.8	
140	BOSTON GET THERE	1021.8			
130	LUCKY BUDGE	1031.8		848.6	
127	MILAN	1059.7			
123	McKINLEY	1076.4			
124	TEN O'CLOCK	1056.6		881.0	
147-H	NOWATA	1067.6			
146	WHAT CHEER	1069.8		888.7	
147	CHURCH MITCHELL	1073.3			
148	ALABAMA-YOOEY	1037.6		966.6	
145	COAHUILA	1070.5			
149	Hyde Park No. 10 Pump	1060.2		845.4	
	National No. 11 Pump	988.9			
126	Florine No. 12 Pump	1053.1			
150	KING WILLIAM	1085.7		876.6	
151	FED. PUMP SW.	1081.5		877.4	
152	WILSON-BALTIC	1077.8		909.9	
76	PREMIER	974.3		781.7	
	SUNFLOWER	927.9			

Traced from G.M. Fowler Map.

WILLIAM M. STEWART - E.M.
JOPLIN, MISSOURI.

UNDERGROUND WORKINGS
ORONOCO - WEBB CITY - QUENWEG AREA

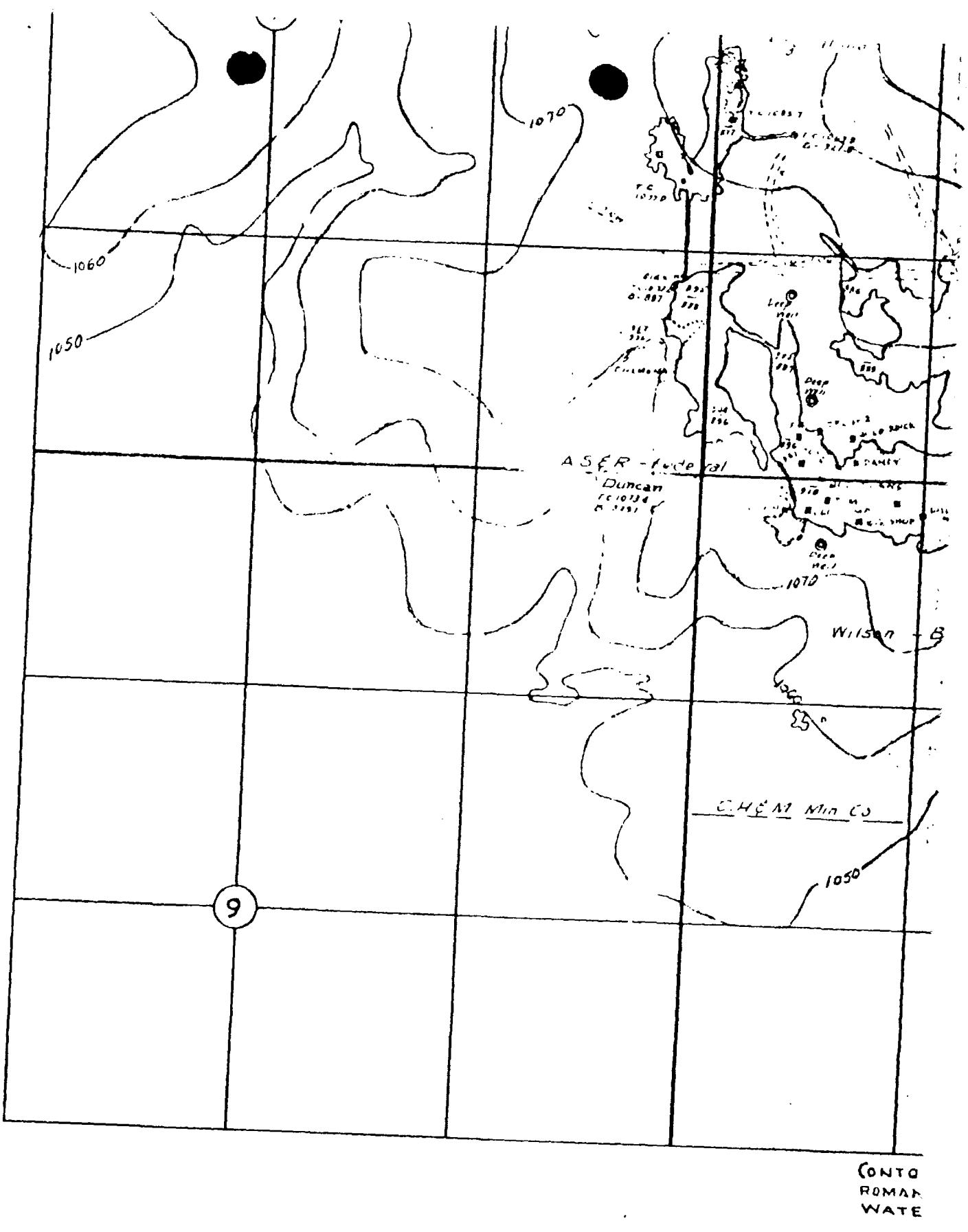


THURSTON CHEMICAL CO.

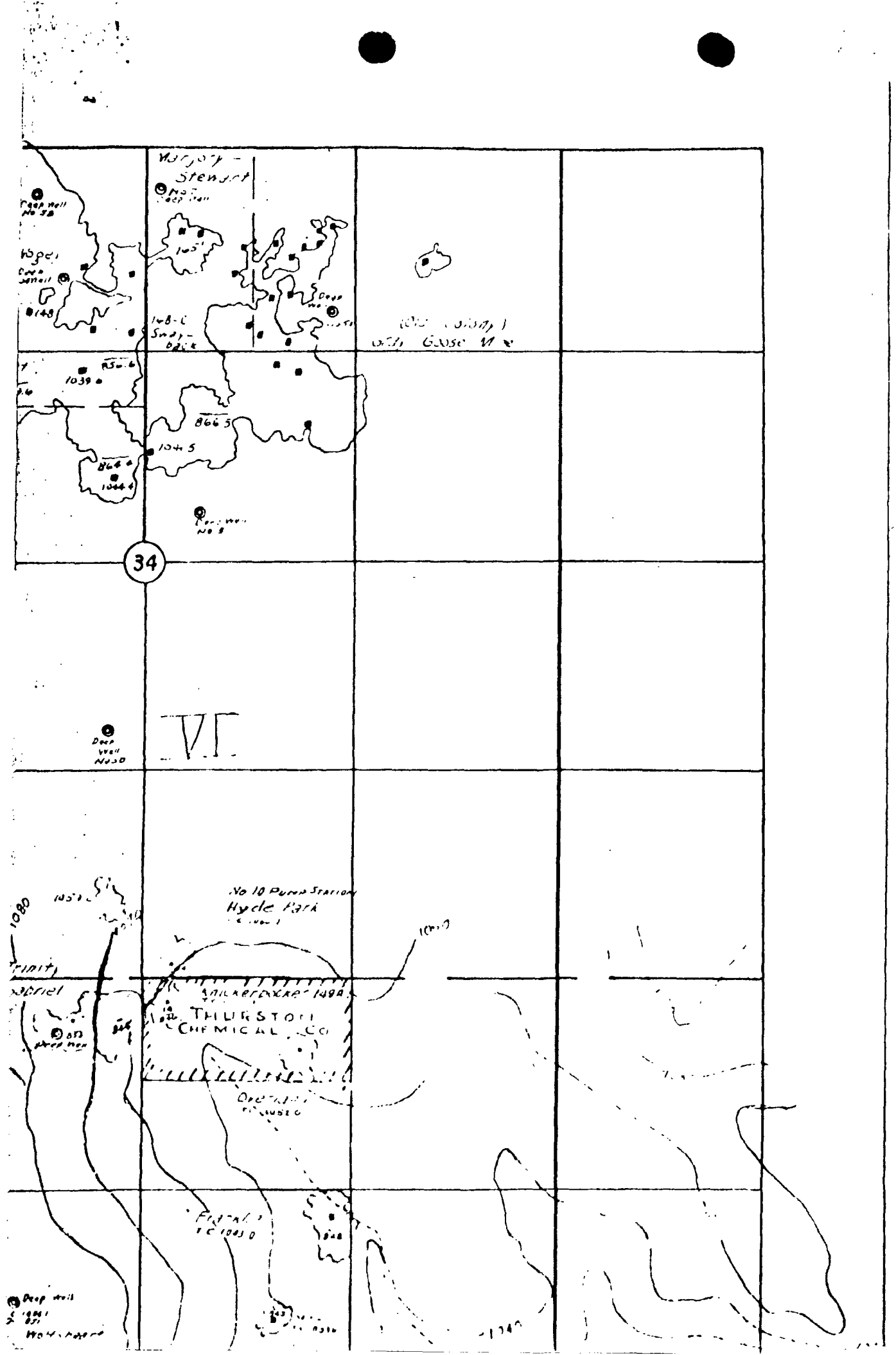
MINED AREAS
DUENWEG, MO., DISTRICT

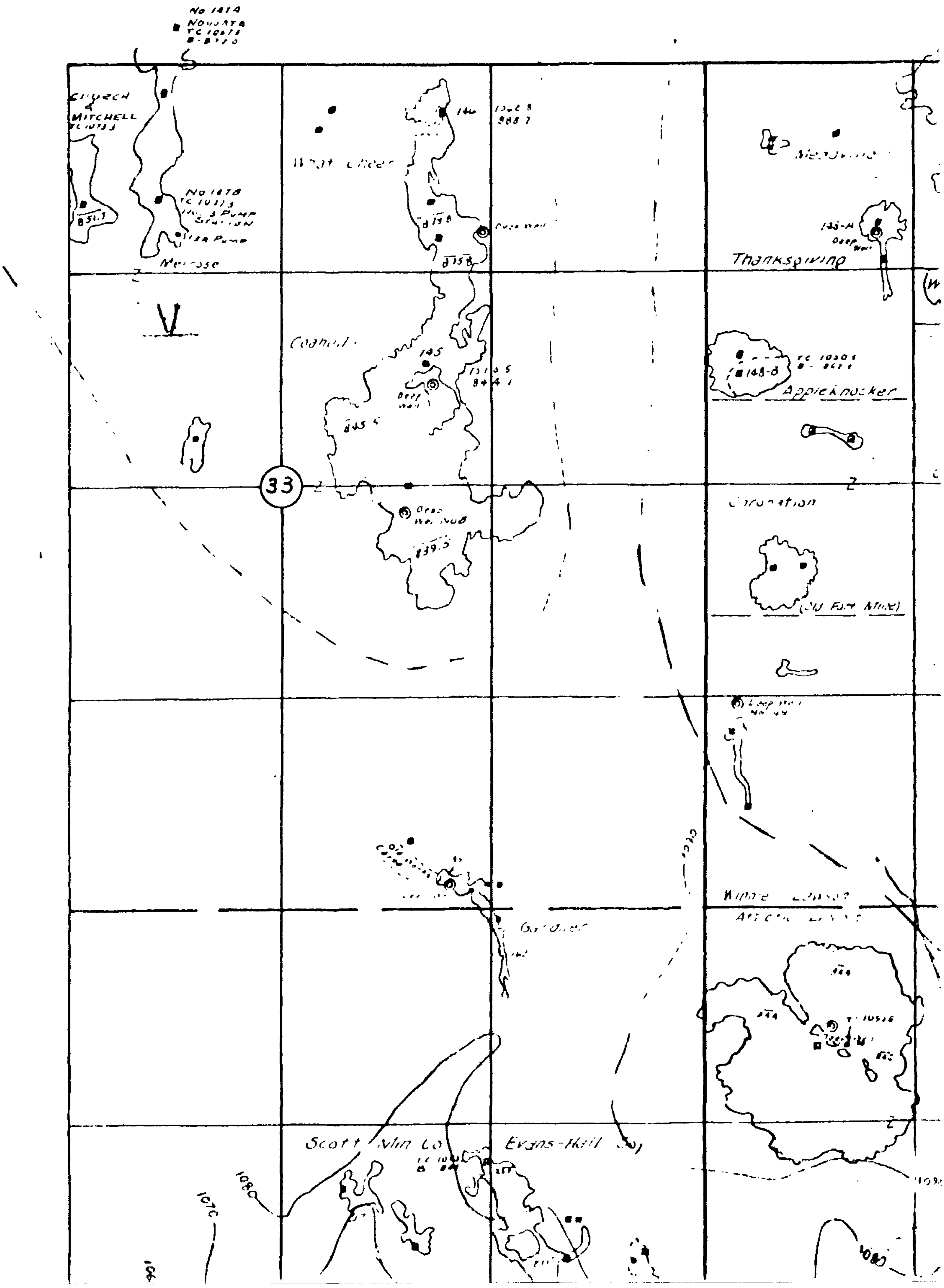
SEPT. - 1953 | SCALE: 1" = 800 FT.

William M. Stewart Engineering Co.
JOPLIN, MO.



CONTO
ROMAN
WATE


34
No 10 Pump Station
Hyde Park
THURSTON
CHEMICAL CO


No 1414
NOWATA
Church
Mitchell
No 1418
Melrose
V
What Cheer
Deep Well
Coal Hill
Deep Well
33
Deep Well No 8
Thanksgiving
Deep Well
148-8
Appleknocker
Coronation
(Old Fort Mine)
Winnie
Gardner
Scott Min Co
Evans-Hall
1080
1070